

WO 00/34448

SEQUENCE LISTING

<110> E. I. DU PONT DE NEMOURS AND COMPANY

<120> PLANT 1-DEOXY-D-XYLULOSE 5-PHOSPHATE REDUCTOISOMERASE

<130> BB1297

<140>

<141>

<150> 60/110,865

<151> 1998-DECEMBER-04

<160> 22

<170> Microsoft Office 97

<210> 1

<211> 565

<212> DNA

<213> Zea mays

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<221> unsure

<222> (549)

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ccctccctct	ccccctcctc	gccagcggc	aattaccaca	gcctccccag	caagccggga	180
tggtgcact	caaggcatcg	ttccggggtg	agctcagcgc	cgcttccttc	ctcgactcca	240
gcaggggacc	tctcgtccag	cacaaagtgg	attttacgtt	tcaaaggaag	ggcaaacgag	300
ctatttcact	gagaaggaca	tgctgttcta	tgcaacaggc	tccaccacca	gcatggcctg	360
ggcgagctgt	tgctgagcct	ggccggagtc	atgggatggc	ccaaagccta	tctcgattgt	420
tggttcaact	ggttccatag	gaacacagan	attggacatt	gttgcggaga	atcctgataa	480
gttcagagtt	gttgctcttg	ctgctggatc	caatgtcacg	cttctagctg	atcaggtcaa	540
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<211> 63

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<213> Zea mays

<220>

<221> UNSURE

<222> (25)

<220>

<221> UNSURE

<222> (58)

<400> 2

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Ser Thr Gly Ser Ile Gly Thr Gln Xaa Leu Asp Ile Val Ala Glu Asn
 20 25 30

Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser Asn Val Thr
 35 40 45

Leu Leu Ala Asp Gln Val Lys Thr Phe Xaa Pro Lys Leu Val Arg
 50 55 60

<210> 3

<211> 868

<212> DNA

<213> Zea mays

<220>

<221> unsure

<222> (343)

<220>

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<222> (356)

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<221> unsure

<222> (862)

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aatatgggaa	ggaagatcac	agtagattct	gctactttat	tcaacaaggg	tttagaagtt	480
attgaagcac	attatttatt	tgggtgctgaa	tatgatgaca	ttgagattgt	gattcaccca	540
cagtctatca	tacactctat	ggttgaaacc	caggattcat	ctgtcctagc	tcagttggga	600
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cgctgctaata	gagaaggccg	tggagttggt	cattgacgag	aagattagct	acctggacat	720
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<210> 4

<211> 217

<212> PRT

<213> Zea mays

<220>

<221> UNSURE

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<221> UNSURE

<222> (119)

<220>

<221> UNSURE

<222> (123)

<400> 4

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Ile Pro Gly Glu Gln Gly Val Ile Glu Val Ala Arg His Pro Asp Ala
 20 25 30

Val Thr Val Val Thr Gly Ile Val Gly Cys Ala Gly Leu Lys Pro Thr
 35 40 45

Val Ala Ala Ile Glu Ala Gly Lys Asp Ile Ala Leu Ala Asn Lys Glu
 50 55 60

Thr Leu Ile Ala Gly Gly Pro Phe Val Leu Pro Leu Ala His Lys His
 65 70 75 80

Lys Val Lys Ile Leu Pro Ala Asp Ser Glu His Ser Ala Ile Phe Gln
 85 90 95

Cys Ile Gln Gly Leu Ser Glu Gly Ala Leu Arg Arg Ile Ile Leu Thr
 100 105 110

Ala Ser Xaa Gly Ala Phe Xaa Asp Trp Pro Xaa Asp Arg Leu Lys Asp
 115 120 125

Val Lys Val Ala Asp Ala Leu Lys His Pro Asn Trp Asn Met Gly Arg
 130 135 140

Lys Ile Thr Val Asp Ser Ala Thr Leu Phe Asn Lys Gly Leu Glu Val
 145 150 155 160

Ile Glu Ala His Tyr Leu Phe Gly Ala Glu Tyr Asp Asp Ile Glu Ile
 165 170 175

Val Ile His Pro Gln Ser Ile Ile His Ser Met Val Glu Thr Gln Asp
 180 185 190

Ser Ser Val Leu Ala Gln Leu Gly Trp Pro Asp Met Arg Leu Pro Ile
 195 200 205

Leu Tyr Thr Leu Ser Trp Pro Asp Arg
 210 215

<210> 5

<211> 1901

<212> DNA

<213> Oryza sativa

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cggcacgagg tttaaaccag acgtcgagtc gagcattaac tcagtcaggg tggccatggc 180
gctcaaggtc gtctctttcc ccggggactt ggccgcggtc tcattcctcg actccaacag 240
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tggtcacaac ggttctattg gcacacagac attggacata gttgcggaga atccagataa 480
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aacattcaaa ccaaagcttg ttgctgtaag aaatgagtca ttagttgatg agctaaagga 600
agccttagct gattgtgatt ggaagccaga aattattcct ggtgagcaag gtgtcataga 660
ggttgctcgc caccagatg cagttacagt tgttactggg atagtagggt gtgcaggact 720
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ctctatgatt gaaacccagg attcatctgt gttggctcaa ctgggatggc cagatatgag 1200
gataccaacc ttatacacca tgtcttggcc agacagaatc tattgctcag aggtcacctg 1260
gccccgacta gatctttgca agctgggttc actgacattc aaagctcctg acaatgtgaa 1320
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tctgagtgct gctaatagaga aggctgtgga gttgttcac gatgaaaaga tcgggtacct 1440
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gccatcactg gaggagatca tacattatga tctgtgggag agggagtatg ctgccagcct 1560
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tagctatata tagatgagag agaattttaa ggatgtaaat catgccttca catgaataaa 1740
tcgttcgtcc gtgctgtgtg tattcatgta aattttgacg gatgggtcaag taaaaataac 1800
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aattcgccct atagtgagtc gtattacgcg cgctcactgg c 1901

<210> 6
<211> 473
<212> PRT
<213> Oryza sativa

<400> 6
Met Ala Leu Lys Val Val Ser Phe Pro Gly Asp Leu Ala Ala Val Ser
1 5 10 15
Phe Leu Asp Ser Asn Arg Gly Gly Ala Phe Asn Gln Leu Lys Val Asp
20 25 30
Leu Pro Phe Gln Thr Arg Asp Arg Arg Ala Val Ser Leu Arg Arg Thr
35 40 45
Cys Cys Ser Met Gln Gln Ala Pro Pro Pro Ala Trp Pro Gly Arg Ala
50 55 60
Val Val Glu Pro Gly Arg Arg Ser Trp Asp Gly Pro Lys Pro Ile Ser
65 70 75 80
Ile Val Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp Ile Val
85 90 95
Ala Glu Asn Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser
100 105 110

Asn Val Thr Leu Leu Ala Asp Gln Val Lys Thr Phe Lys Pro Lys Leu
 115 120 125
 Val Ala Val Arg Asn Glu Ser Leu Val Asp Glu Leu Lys Glu Ala Leu
 130 135 140
 Ala Asp Cys Asp Trp Lys Pro Glu Ile Ile Pro Gly Glu Gln Gly Val
 145 150 155 160
 Ile Glu Val Ala Arg His Pro Asp Ala Val Thr Val Val Thr Gly Ile
 165 170 175
 Val Gly Cys Ala Gly Leu Lys Pro Thr Val Ala Ala Ile Glu Ala Gly
 180 185 190
 Lys Asp Ile Ala Leu Ala Asn Lys Glu Thr Leu Ile Ala Gly Gly Pro
 195 200 205
 Phe Val Leu Pro Leu Ala Gln Lys His Lys Val Lys Ile Leu Pro Ala
 210 215 220
 Asp Ser Glu His Ser Ala Ile Phe Gln Cys Ile Gln Gly Leu Pro Glu
 225 230 235 240
 Gly Ala Leu Arg Arg Ile Ile Leu Thr Ala Ser Gly Gly Ala Phe Arg
 245 250 255
 Asp Trp Pro Val Asp Lys Leu Lys Glu Val Lys Val Ala Asp Ala Leu
 260 265 270
 Lys His Pro Asn Trp Asn Met Gly Lys Lys Ile Thr Val Asp Ser Ala
 275 280 285
 Thr Leu Phe Asn Lys Gly Leu Glu Val Ile Glu Ala His Tyr Leu Phe
 290 295 300
 Gly Ala Glu Tyr Asp Asp Ile Glu Ile Val Ile His Pro Gln Ser Ile
 305 310 315 320
 Ile His Ser Met Ile Glu Thr Gln Asp Ser Ser Val Leu Ala Gln Leu
 325 330 335
 Gly Trp Pro Asp Met Arg Ile Pro Thr Leu Tyr Thr Met Ser Trp Pro
 340 345 350
 Asp Arg Ile Tyr Cys Ser Glu Val Thr Trp Pro Arg Leu Asp Leu Cys
 355 360 365
 Lys Leu Gly Ser Leu Thr Phe Lys Ala Pro Asp Asn Val Lys Tyr Pro
 370 375 380
 Ser Met Asp Leu Ala Tyr Ala Ala Gly Arg Ala Gly Gly Thr Met Thr
 385 390 395 400
 Gly Val Leu Ser Ala Ala Asn Glu Lys Ala Val Glu Leu Phe Ile Asp
 405 410 415
 Glu Lys Ile Gly Tyr Leu Asp Ile Phe Lys Val Val Glu Leu Thr Cys
 420 425 430

Asp Ala His Arg Asn Glu Leu Val Thr Arg Pro Ser Leu Glu Glu Ile
 435 440 445

Ile His Tyr Asp Leu Trp Ala Arg Glu Tyr Ala Ala Ser Leu Gln Pro
 450 455 460

Ser Thr Gly Leu Ser Pro Val Pro Val
 465 470

<210> 7
 <211> 1592
 <212> DNA
 <213> Glycine max

<220>
 <221> unsure
 <222> (993)

<220>
 <221> unsure
 <222> (1402)

<400> 7
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 gcatggccag gaacagctat tcccgagcct tctgatttca agacatggga tgggcaaaaa 240
 cctatttctg tcttaggatc tacgggttca attggaactc agacactgag tatagtggct 300
 gagttcccag aaagatttaa agttgtgagc cttgctgctg gctctaatat tactcttctt 360
 gctgaccaga ttaaaacatt taagcctgaa gttgttggtc ttagaaatga gtctttaatt 420
 gatgaactca aagaggcttt ggctgatgtg gatcacaaac ccgaaatcat ccctggagag 480
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 gggtgtgcag gattaaagcc aacagttgca gcaattgaag cagggaaga catagcattg 600
 gccaacaaag agacaatgat tgcgggagcc ccttttggtc ttcctcttgc tcacaaacat 660
 aacataaaaa ttcttcccgc tgattcggaa cattctgcaa tttttcagtc tatccagggg 720
 ttgccaaaag gtgcacttag gaaaatcctt ttaactggat caggaggtgc tttcagagaa 780
 tggcctgctg aaaagatgaa agatattaag cttgctgatg cattaaagca tcccatatgg 840
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 caatccatca tacattcctt ggttgaaaac cangattcat ctgttaatgc acagttgggg 1020
 atacctgaca tgcgcttacc gtccttttat acattatcct ggccagaaaag aatctattgc 1080
 tctgaagtaa cttggcctcg tcttgatctt agcaagtatg gttctctaac attttatgca 1140
 ccggatgaca agaagtttcc atcgggtgaat ctttgctatg ctgcgggacg tgctggaggc 1200
 accatgacag gagttcttag tgcagcaaat gagaaagctg tagaaatgtt tgttgaagaa 1260
 aagattagtt atctggatat attcaagggt gtggaactaa cttgtcagga acatcaaaaag 1320
 gaattagtag catctccgtc actcgaagaa attattcact atgaccaatg ggctcgacaa 1380
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 agaagttggg gctgtggtgg attgttgga actgctagca tattttgtaa atgtattgtt 1500
 gggtcatcaa tcttgtaaaa tgtaaagggg taagctatat aaagtatatg tactcctaaa 1560
 agggtttcaa taaaagttct agcttcaaga aa 1592

<210> 8
 <211> 499
 <212> PRT
 <213> Glycine max

<220>
 <221> UNSURE
 <222> (325)

<220>

<221> UNSURE

<222> (462)

<400> 8

Met Ala Leu Asn Leu Pro Ser Pro Ala Gln Val Lys Pro Leu Phe Phe
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Ser Ser Asn Asn Ser Thr Lys Leu Pro Gly Ser Phe Ser Leu Lys Arg
 20 25 30

Lys Asp Ser Asp Thr Thr Val Glu Arg Arg Val Tyr Cys Ser Ala Ala
 35 40 45

Ala Gln Ser Pro Pro Pro Ala Trp Pro Gly Thr Ala Ile Pro Glu Pro
 50 55 60

Ser Asp Phe Lys Thr Trp Asp Gly Gln Lys Pro Ile Ser Val Leu Gly
 65 70 75 80

Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Ser Ile Val Ala Glu Phe
 85 90 95

Pro Glu Arg Phe Lys Val Val Ser Leu Ala Ala Gly Ser Asn Ile Thr
 100 105 110

Leu Leu Ala Asp Gln Ile Lys Thr Phe Lys Pro Glu Val Val Gly Leu
 115 120 125

Arg Asn Glu Ser Leu Ile Asp Glu Leu Lys Glu Ala Leu Ala Asp Val
 130 135 140

Asp His Lys Pro Glu Ile Ile Pro Gly Glu Gln Gly Val Ile Glu Ala
 145 150 155 160

Ala Arg His Pro Asp Ala Thr Thr Val Val Thr Gly Ile Val Gly Cys
 165 170 175

Ala Gly Leu Lys Pro Thr Val Ala Ala Ile Glu Ala Gly Lys Asp Ile
 180 185 190

Ala Leu Ala Asn Lys Glu Thr Met Ile Ala Gly Ala Pro Phe Val Leu
 195 200 205

Pro Leu Ala His Lys His Asn Ile Lys Ile Leu Pro Ala Asp Ser Glu
 210 215 220

His Ser Ala Ile Phe Gln Ser Ile Gln Gly Leu Pro Lys Gly Ala Leu
 225 230 235 240

Arg Lys Ile Leu Leu Thr Gly Ser Gly Gly Ala Phe Arg Glu Trp Pro
 245 250 255

Ala Glu Lys Met Lys Asp Ile Lys Leu Ala Asp Ala Leu Lys His Pro
 260 265 270

Ile Trp Ser Leu Gly Arg Lys Ile Thr Ile Asp Ser Ala Thr Leu Phe
 275 280 285

Asn Lys Gly Leu Glu Val Ile Glu Ala His Tyr Leu Phe Gly Ala Ser
 290 295 300
 Tyr Asp Asp Ile Glu Ile Val Ile His Pro Gln Ser Ile Ile His Ser
 305 310 315 320
 Leu Val Glu Thr Xaa Asp Ser Ser Val Asn Ala Gln Leu Gly Ile Pro
 325 330 335
 Asp Met Arg Leu Pro Leu Leu Tyr Thr Leu Ser Trp Pro Glu Arg Ile
 340 345 350
 Tyr Cys Ser Glu Val Thr Trp Pro Arg Leu Asp Leu Ser Lys Tyr Gly
 355 360 365
 Ser Leu Thr Phe Tyr Ala Pro Asp Asp Lys Lys Phe Pro Ser Val Asn
 370 375 380
 Leu Cys Tyr Ala Ala Gly Arg Ala Gly Gly Thr Met Thr Gly Val Leu
 385 390 395 400
 Ser Ala Ala Asn Glu Lys Ala Val Glu Met Phe Val Glu Glu Lys Ile
 405 410 415
 Ser Tyr Leu Asp Ile Phe Lys Val Val Glu Leu Thr Cys Gln Glu His
 420 425 430
 Gln Lys Glu Leu Val Ala Ser Pro Ser Leu Glu Glu Ile Ile His Tyr
 435 440 445
 Asp Gln Trp Ala Arg Gln Tyr Ala Ala Ser Leu Gln Lys Xaa Phe Lys
 450 455 460
 Cys Leu Asn Pro Ile Phe Leu Thr Tyr Phe Arg Ser Trp Gly Cys Gly
 465 470 475 480
 Gly Leu Leu Ala Thr Ala Ser Ile Phe Cys Lys Cys Ile Val Gly Ser
 485 490 495
 Ser Ile Leu

<210> 9
 <211> 784
 <212> DNA
 <213> Glycine max

<220>
 <221> unsure
 <222> (55)

<220>
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 <222> (100)

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<220>
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 actggttcaa ttggaactca gacactagat attgtggcag agaatccaga taagttttaa 180
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 aagcctcaac ttgttgctgt tagaaatgag tccctaattg ctgaacttga agaggccttg 300
 catgatgttg aagaaaaacc tgagatcatc cctggagagc aggggaatcat tgaggttgct 360
 cgtcaccacag atgcagttag tgtagtcaca ggaatagtag gctgtgcagg actgaagcca 420
 acagttgcag cgatagaagc agggaaagac atagcttttg ccaacaaaga gacattgatt 480
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 ttaaagtgtg tgatncatta aaacatccta ctggaatatg ggggaaagaa ctgtggactc 720
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 <212> PRT
 <213> Glycine max

<220>

<221> UNSURE

<222> (19)

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<221> UNSURE

<222> (183)

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Pro Gly Xaa Ala Val Pro Glu Gln Gly Arg Lys Thr Trp Asp Gly Pro
 20 25 30

Lys Pro Ile Ser Ile Val Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr
 35 40 45

Leu Asp Ile Val Ala Glu Asn Pro Asp Lys Phe Lys Val Val Ala Leu
 50 55 60

Ala Ala Gly Ser Asn Val Thr Leu Leu Ala Asp Gln Val Lys Arg Phe
 65 70 75 80

Lys Pro Gln Leu Val Ala Val Arg Asn Glu Ser Leu Ile Ala Glu Leu
 85 90 95

Glu Glu Ala Leu His Asp Val Glu Glu Lys Pro Glu Ile Ile Pro Gly
 100 105 110

Glu Gln Gly Ile Ile Glu Val Ala Arg His Pro Asp Ala Val Ser Val
 115 120 125

Val Thr Gly Ile Val Gly Cys Ala Gly Leu Lys Pro Thr Val Ala Ala
 130 135 140

Ile Glu Ala Gly Lys Asp Ile Ala Leu Ala Asn Lys Glu Thr Leu Ile
 145 150 155 160

Ala Gly Gly Pro Leu Ser Pro Leu Ala Gln Lys His Asn Val Lys Ile
 165 170 175

Leu Pro Ala Asp Ser Asp Xaa Ser Ala Ile Phe Gln Cys Ile Gln Gly
 180 185 190

Leu Pro Glu Gly Ala Leu Arg Arg Val Ile Leu Thr Ala Ser Gly Gly
 195 200 205

Ala Phe Arg Gly Trp Pro Val
 210 215

<210> 11

<211> 642

<212> DNA

<213> Triticum aestivum

<220>

<221> unsure

<222> (506)

<220>
 <221> unsure
 <222> (516)

<220>
 <221> unsure
 <222> (534)

<220>
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 <222> (625)

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 <222> (628)

<400> 11
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 tgcctacctg aggacatgct gctccatgca gcagggccca ccgccccgct ggccaggccg 180
 agccgtcgtg gaacctgaga ggaggtcgtg ggagggcccc aagcccatct ccatcgtcgg 240
 ctcaaccggt tccataggaa cacagacatt ggacatcggt gcggagaacc tgacaagtgc 300
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 gttcaaacca aactgggtgg tgttaagaaa cgatccatta cttaacgagc taaaggaagc 420
 attaaactgg tgtgaaagag atccggatta tccctgggga caagtgcata gaggcgcacc 480
 cacccgagc attacatcct tacggnatat aggttncaag atcaacctac attncaacat 540
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 naacanattg aaatactctg cgatnaanat ctgatatcat ga 642

<210> 12
 <211> 94
 <212> PRT
 <213> Triticum aestivum

<400> 12
 Met Gln Gln Gly Pro Pro Pro Ala Trp Pro Gly Arg Ala Val Val Glu
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 Pro Glu Arg Arg Ser Trp Glu Gly Pro Lys Pro Ile Ser Ile Val Gly
 20 25 30
 Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp Ile Val Ala Glu Asn
 35 40 45
 Leu Thr Ser Ser Arg Val Val Ala Leu Ala Ala Gly Ser Asn Val Thr
 50 55 60
 Pro Leu Ala Asp Lys Val Lys Thr Phe Lys Pro Asn Trp Val Val Leu
 65 70 75 80
 Arg Asn Asp Pro Leu Leu Asn Glu Leu Lys Glu Ala Leu Thr
 85 90

<210> 13
 <211> 360
 <212> DNA
 <213> Triticum aestivum

<220>
 <221> unsure
 <222> (295)

<220>
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 <222> (299)

<220>
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 <222> (313)

<220>
 <221> unsure
 <222> (338)

<220>
 <221> unsure
 <222> (352)

<400> 13
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 <211> 93
 <212> PRT
 <213> Triticum aestivum

<220>
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 <222> (59)

<400> 14

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Tyr Thr Leu Ser Trp Pro Asp Arg Val Tyr Cys Ser Glu Val Thr Trp
 20 25 30

Pro Arg Leu Asp Leu Cys Lys Leu Gly Ser Leu Thr Phe Lys Ala Pro
 35 40 45

Asp Asn Val Lys Tyr Pro Ser Val Asp Leu Xaa Xaa Tyr Ala Ala Gly
 50 55 60

Arg Ala Gly Gly Thr Met Thr Gly Phe Leu Ser Ala Ala Asn Glu Lys
 65 70 75 80

Ala Trp Ser Leu Phe Ile Asp Glu Lys Ile Asn Tyr Leu
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<210> 15

<211> 1847

<212> DNA

<213> Zea mays

<220>

<221> unsure

<222> (5)..(9)

<400> 15

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<210> 16
 <211> 472
 <212> PRT
 <213> Zea mays

<400> 16
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 35 40 45
 Cys Ser Met Gln Gln Ala Pro Pro Pro Ala Trp Pro Gly Arg Ala Val
 50 55 60
 Ala Glu Pro Gly Arg Arg Ser Trp Asp Gly Pro Lys Pro Ile Ser Ile
 65 70 75 80
 Val Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp Ile Val Ala
 85 90 95
 Glu Asn Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser Asn
 100 105 110
 Val Thr Leu Leu Ala Asp Gln Val Lys Thr Phe Lys Pro Lys Leu Val
 115 120 125
 Ala Val Arg Asn Glu Ser Leu Val Asp Glu Leu Lys Glu Ala Leu Ala
 130 135 140
 Asp Cys Glu Glu Lys Pro Glu Ile Ile Pro Gly Glu Gln Gly Val Ile
 145 150 155 160
 Glu Val Ala Arg His Pro Asp Ala Val Thr Val Val Thr Gly Ile Val
 165 170 175
 Gly Cys Ala Gly Leu Lys Pro Thr Val Ala Ala Ile Glu Ala Gly Lys
 180 185 190
 Asp Ile Ala Leu Ala Asn Lys Glu Thr Leu Ile Ala Gly Gly Pro Phe
 195 200 205
 Val Leu Pro Leu Ala His Lys His Lys Val Lys Ile Leu Pro Ala Asp
 210 215 220
 Ser Glu His Ser Ala Ile Phe Gln Cys Ile Gln Gly Leu Ser Glu Gly
 225 230 235 240
 Ala Leu Arg Arg Ile Ile Leu Thr Ala Ser Gly Gly Ala Phe Arg Asp
 245 250 255
 Trp Pro Val Asp Arg Leu Lys Asp Val Lys Val Ala Asp Ala Leu Lys
 260 265 270

His Pro Asn Trp Asn Met Gly Arg Lys Ile Thr Val Asp Ser Ala Thr
 275 280 285
 Leu Phe Asn Lys Gly Leu Glu Val Ile Glu Ala His Tyr Leu Phe Gly
 290 295 300
 Ala Glu Tyr Asp Asp Ile Glu Ile Val Ile His Pro Gln Ser Ile Ile
 305 310 315 320
 His Ser Met Val Glu Thr Gln Asp Ser Ser Val Leu Ala Gln Leu Gly
 325 330 335
 Trp Pro Asp Met Arg Leu Pro Ile Leu Tyr Thr Leu Ser Trp Pro Asp
 340 345 350
 Arg Ile Tyr Cys Ser Glu Val Thr Trp Pro Arg Leu Asp Leu Cys Lys
 355 360 365
 Leu Gly Ser Leu Thr Phe Arg Ala Pro Asp Asn Val Lys Tyr Pro Ser
 370 375 380
 Met Asp Leu Ala Tyr Ala Ala Gly Arg Ala Gly Gly Thr Met Thr Gly
 385 390 395 400
 Val Leu Ser Ala Ala Asn Glu Lys Ala Val Glu Leu Phe Ile Asp Glu
 405 410 415
 Lys Ile Ser Tyr Leu Asp Ile Phe Lys Val Val Glu Leu Thr Cys Asn
 420 425 430
 Ala His Arg Asn Glu Leu Val Thr Ser Pro Ser Leu Glu Glu Ile Val
 435 440 445
 His Tyr Asp Leu Trp Ala Arg Arg Tyr Ala Ala Ser Leu Gln Pro Ser
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 Ser Gly Leu Ser Pro Val Pro Ala
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<210> 17
 <211> 2019
 <212> DNA
 <213> Glycine max

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 tactcttctt gcagaccagg taaaaagatt taagcctcaa cttgttgctg ttagaaatga 480
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 tatccagggg ttgccagagg gtgcacttag gagagttatt ttaactgcat ctggaggtgc 840
 ttccagggat tggccagttg ataaactgaa agatgttaaa gttgctgatg cattaataca 900

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tctagaagta attgaagcac attacttggt tggagctgac tacgatcata ttgagattgt 1020
cattcatcca caatcaatca tacattcaat gattgaaaca caggattcat ctgttcttgc 1080
acaattgggg tggcctgata tgcgtttgcc aatcctctat acattatcat ggctgacag 1140
gatttattgt tctgaagtca cttggccacg ccttgatctt tgcaagcttg gttcacttac 1200
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<210> 18
 <211> 475
 <212> PRT
 <213> Glycine max

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 35 40 45
 Val Tyr Cys Ser Val Gln Ala Thr Pro Pro Pro Pro Ala Trp Pro Gly
 50 55 60
 Arg Ala Val Pro Glu Gln Gly Arg Lys Thr Trp Asp Gly Pro Lys Pro
 65 70 75 80
 Ile Ser Ile Val Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp
 85 90 95
 Ile Val Ala Glu Asn Pro Asp Lys Phe Lys Val Val Ala Leu Ala Ala
 100 105 110
 Gly Ser Asn Val Thr Leu Leu Ala Asp Gln Val Lys Arg Phe Lys Pro
 115 120 125
 Gln Leu Val Ala Val Arg Asn Glu Ser Leu Ile Ala Glu Leu Glu Glu
 130 135 140
 Ala Leu His Asp Val Glu Glu Lys Pro Glu Ile Ile Pro Gly Glu Gln
 145 150 155 160
 Gly Ile Ile Glu Val Ala Arg His Pro Asp Ala Val Ser Val Val Thr
 165 170 175

Gly Ile Val Gly Cys Ala Gly Leu Lys Pro Thr Val Ala Ala Ile Glu
 180 185 190
 Ala Gly Lys Asp Ile Ala Leu Ala Asn Lys Glu Thr Leu Ile Ala Gly
 195 200 205
 Gly Pro Phe Val Leu Pro Leu Ala Gln Lys His Asn Val Lys Ile Leu
 210 215 220
 Pro Ala Asp Ser Glu His Ser Ala Ile Phe Gln Cys Ile Gln Gly Leu
 225 230 235 240
 Pro Glu Gly Ala Leu Arg Arg Val Ile Leu Thr Ala Ser Gly Gly Ala
 245 250 255
 Phe Arg Asp Trp Pro Val Asp Lys Leu Lys Asp Val Lys Val Ala Asp
 260 265 270
 Ala Leu Lys His Pro Asn Trp Asn Met Gly Lys Lys Ile Thr Val Asp
 275 280 285
 Ser Ala Thr Leu Phe Asn Lys Gly Leu Glu Val Ile Glu Ala His Tyr
 290 295 300
 Leu Phe Gly Ala Asp Tyr Asp His Ile Glu Ile Val Ile His Pro Gln
 305 310 315 320
 Ser Ile Ile His Ser Met Ile Glu Thr Gln Asp Ser Ser Val Leu Ala
 325 330 335
 Gln Leu Gly Trp Pro Asp Met Arg Leu Pro Ile Leu Tyr Thr Leu Ser
 340 345 350
 Trp Pro Asp Arg Ile Tyr Cys Ser Glu Val Thr Trp Pro Arg Leu Asp
 355 360 365
 Leu Cys Lys Leu Gly Ser Leu Thr Phe Lys Thr Pro Asp Asn Val Lys
 370 375 380
 Tyr Pro Ser Met Asn Leu Ala Phe Ser Ala Gly Arg Ala Gly Gly Thr
 385 390 395 400
 Met Thr Gly Val Leu Ser Ala Ala Asn Glu Lys Ala Val Glu Met Phe
 405 410 415
 Ile Asp Glu Lys Ile Ser Tyr Trp Asn Leu Phe Lys Val Val Glu Leu
 420 425 430
 Thr Cys Glu Lys His Gln Asn Glu Leu Val Ser Ser Pro Ser Leu Glu
 435 440 445
 Glu Ile Ile His Tyr Asp Leu Trp Ala Arg Lys Tyr Ala Ala Ser Leu
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 Gln Asp Ser Ser Ser Phe Thr Pro Ile Leu Ala
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<210> 19
 <211> 1640

<212> DNA

<213> *Triticum aestivum*

<400> 19

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1640

<210> 20

<211> 473

<212> PRT

<213> *Triticum aestivum*

<400> 20

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          20              25              30
Leu Thr Phe Gln Arg Arg Asp Lys Arg Ala Ala Tyr Leu Arg Thr Cys
          35              40              45
Cys Ser Met Gln Gln Gly Pro Pro Pro Ala Trp Pro Gly Arg Ala Val
          50              55              60
Ala Glu Pro Glu Arg Arg Ser Trp Glu Gly Pro Lys Pro Ile Ser Ile
          65              70              75              80
Val Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp Ile Val Ala
          85              90              95
Glu Asn Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser Asn
          100              105              110

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Val Thr Leu Leu Ala Asp Gln Val Lys Thr Phe Lys Pro Lys Leu Val
 115 120 125
 Ala Val Arg Asn Glu Ser Leu Leu Asn Glu Leu Lys Glu Ala Leu Ala
 130 135 140
 Gly Cys Glu Glu Met Pro Glu Ile Ile Pro Gly Glu Gln Gly Val Ile
 145 150 155 160
 Glu Val Ala Arg His Pro Asp Ala Val Thr Val Val Thr Gly Ile Val
 165 170 175
 Gly Cys Ala Gly Leu Lys Pro Thr Val Ala Ala Ile Glu Ala Gly Lys
 180 185 190
 Asp Ile Ala Leu Ala Asn Lys Glu Thr Leu Ile Ala Gly Gly Pro Phe
 195 200 205
 Val Leu Pro Leu Ala His Lys His Asn Val Lys Ile Leu Pro Ala Asp
 210 215 220
 Ser Glu His Ser Ala Ile Phe Gln Cys Ile Gln Gly Leu Ser Glu Gly
 225 230 235 240
 Ser Leu Arg Arg Val Ile Leu Thr Ala Ser Gly Gly Ala Phe Arg Asp
 245 250 255
 Trp Pro Val Glu Lys Leu Lys Asp Val Lys Val Ala Asp Ala Leu Lys
 260 265 270
 His Pro Asn Trp Ser Met Gly Lys Lys Ile Thr Val Asp Ser Ala Thr
 275 280 285
 Leu Phe Asn Lys Gly Leu Glu Val Ile Glu Ala His Tyr Leu Phe Gly
 290 295 300
 Ala Glu Tyr Asp Asp Ile Glu Ile Val Ile His Pro Gln Ser Ile Ile
 305 310 315 320
 His Ser Met Ile Glu Thr Gln Asp Ser Ser Val Leu Ala Gln Leu Gly
 325 330 335
 Trp Pro Asp Met Arg Leu Pro Ile Leu Tyr Thr Leu Ser Trp Pro Asp
 340 345 350
 Arg Val Tyr Cys Ser Glu Val Thr Trp Pro Arg Leu Asp Leu Cys Lys
 355 360 365
 Leu Gly Ser Leu Thr Phe Lys Ala Pro Asp Asn Val Lys Tyr Pro Ser
 370 375 380
 Val Asp Leu Ala Tyr Ala Ala Gly Arg Ala Gly Gly Thr Met Thr Gly
 385 390 395 400
 Val Leu Ser Ala Ala Asn Glu Lys Ala Val Glu Leu Phe Ile Asp Glu
 405 410 415
 Lys Ile Ser Tyr Leu Asp Ile Phe Lys Val Val Glu Met Thr Cys Asp
 420 425 430

Ala His Arg Asn Glu Leu Val Thr Arg Pro Ser Leu Glu Glu Ile Ile
 435 440 445

His Tyr Asp Gln Trp Ala Arg Lys Phe Ala Ala Asn Leu Gln Pro Ser
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Ser Ser Gly Arg Ser Pro Val Leu Ala
 465 470

<210> 21

<211> 406

<212> PRT

<213> Arabidopsis thaliana

<400> 21

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Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser Asn Val Thr
 35 40 45

Leu Leu Ala Asp Gln Val Arg Arg Phe Lys Pro Ala Leu Val Ala Val
 50 55 60

Arg Asn Glu Ser Leu Ile Asn Glu Leu Lys Glu Ala Leu Ala Asp Leu
 65 70 75 80

Asp Tyr Lys Leu Glu Ile Ile Pro Gly Glu Gln Gly Val Ile Glu Val
 85 90 95

Ala Arg His Pro Glu Ala Val Thr Val Val Thr Gly Ile Val Gly Cys
 100 105 110

Ala Gly Leu Lys Pro Thr Val Ala Ala Ile Glu Ala Gly Lys Asp Ile
 115 120 125

Ala Leu Ala Asn Lys Glu Thr Leu Ile Ala Gly Gly Pro Phe Val Leu
 130 135 140

Pro Leu Ala Asn Lys His Asn Val Lys Ile Leu Pro Ala Asp Ser Glu
 145 150 155 160

His Ser Ala Ile Phe Gln Cys Ile Gln Gly Leu Pro Glu Gly Ala Leu
 165 170 175

Arg Lys Ile Ile Leu Thr Ala Ser Gly Gly Ala Phe Arg Asp Trp Pro
 180 185 190

Val Glu Lys Leu Lys Glu Val Lys Val Ala Asp Ala Leu Lys His Pro
 195 200 205

Asn Trp Asn Met Gly Lys Lys Ile Thr Val Asp Ser Ala Thr Leu Phe
 210 215 220

Asn Lys Gly Leu Glu Val Ile Glu Ala His Tyr Leu Phe Gly Ala Glu
 225 230 235 240

Tyr Asp Asp Ile Glu Ile Val Ile His Pro Gln Ser Ile Ile His Ser
 245 250 255
 Met Ile Glu Thr Gln Asp Ser Ser Val Leu Ala Gln Leu Gly Trp Pro
 260 265 270
 Asp Met Arg Leu Pro Ile Leu Tyr Thr Met Ser Trp Pro Asp Arg Val
 275 280 285
 Pro Cys Ser Glu Val Thr Trp Pro Arg Leu Asp Leu Cys Lys Leu Gly
 290 295 300
 Ser Leu Thr Phe Lys Lys Pro Asp Asn Val Lys Tyr Pro Ser Met Asp
 305 310 315 320
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 325 330 335
 Ser Ala Ala Asn Glu Lys Ala Val Glu Met Phe Ile Asp Glu Lys Ile
 340 345 350
 Ser Tyr Leu Asp Ile Phe Lys Val Val Glu Leu Thr Cys Asp Lys His
 355 360 365
 Arg Asn Glu Leu Val Thr Ser Pro Ser Leu Glu Glu Ile Val His Tyr
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 Ala Arg Pro Val His Ala
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<210> 22
 <211> 475
 <212> PRT
 <213> Mentha x piperita

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 35 40 45
 Arg Val His Cys Ser Ala Gln Ser Gln Ser Pro Pro Pro Ala Trp Pro
 50 55 60
 Gly Arg Ala Phe Pro Glu Pro Gly Arg Met Thr Trp Glu Gly Pro Lys
 65 70 75 80
 Pro Ile Ser Val Ile Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu
 85 90 95
 Asp Ile Val Ala Glu Asn Pro Asp Lys Phe Arg Ile Val Ala Leu Ala
 100 105 110

Ala Gly Ser Asn Val Thr Leu Leu Ala Asp Gln Lys Ala Phe Lys Pro
 115 120 125
 Lys Leu Val Ser Val Lys Asp Glu Ser Leu Ile Ser Glu Leu Lys Glu
 130 135 140
 Ala Leu Ala Gly Phe Glu Asp Met Pro Glu Ile Ile Pro Gly Glu Gln
 145 150 155 160
 Gly Met Ile Glu Val Ala Arg His Pro Asp Ala Val Thr Val Val Thr
 165 170 175
 Gly Ile Val Gly Cys Ala Gly Leu Lys Pro Thr Val Ala Ala Ile Glu
 180 185 190
 Ala Gly Lys Asp Ile Ala Leu Ala Asn Lys Glu Thr Leu Ile Ala Gly
 195 200 205
 Gly Pro Phe Val Leu Pro Leu Ala Lys Lys His Asn Val Lys Ile Leu
 210 215 220
 Pro Ala Asp Ser Glu His Ser Ala Ile Phe Gln Cys Ile Gln Gly Leu
 225 230 235 240
 Pro Glu Gly Ala Leu Arg Arg Ile Ile Leu Thr Ala Ser Gly Gly Ala
 245 250 255
 Phe Arg Asp Leu Pro Val Glu Lys Leu Lys Glu Val Lys Val Ala Asp
 260 265 270
 Ala Leu Lys His Ser Asn Trp Asn Met Gly Lys Lys Asn Thr Val Arg
 275 280 285
 Leu Leu Gln Leu Phe Phe Asn Lys Gly Leu Glu Val Ile Lys Ala His
 290 295 300
 Tyr Leu Phe Gly Ala Glu Tyr Asp Asp Ile Glu Ile Val Ile His Ser
 305 310 315 320
 Pro Ser Ile Ile His Ser Met Val Glu Thr Gln Asp Ser Ser Val Leu
 325 330 335
 Ala Gln Leu Gly Trp Pro Asp Met Arg Leu Pro Ile Leu Tyr Thr Leu
 340 345 350
 Ser Trp Pro Glu Arg Val Tyr Cys Ser Glu Ile Thr Trp Pro Arg Leu
 355 360 365
 Asp Leu Cys Lys Val Asp Leu Pro Phe Lys Lys Pro Asp Asn Arg Glu
 370 375 380
 Ile Pro Ala Met Asp Leu Ala Tyr Ala Ala Trp Lys Ser Arg Ser Thr
 385 390 395 400
 Met Thr Gly Val Leu Ser Ala Ala Asn Glu Lys Ala Val Glu Met Phe
 405 410 415
 Ile Asp Glu Lys Ile Gly Tyr Leu Asp Ile Phe Lys Val Val Glu Leu
 420 425 430

Thr Cys Asp Lys His Arg Ser Glu Met Ala Val Ser Pro Ser Leu Glu
435 440 445

Glu Ile Val His Tyr Asp Gln Trp Ala Arg Asp Tyr Ala Ala Thr Val
450 455 460

Leu Lys Ser Ala Gly Leu Ser Pro Ala Leu Val
465 470 475